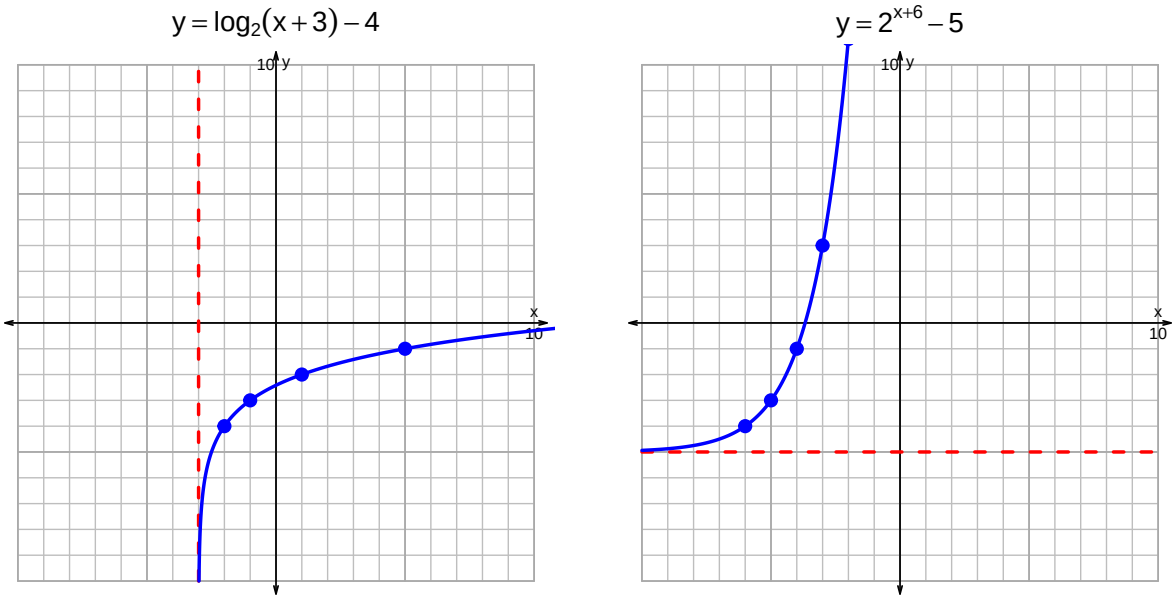
Name: Date:

s18quiz: EXP LOG (Solution v118)

1. Graph $y = \log_2(x+3) - 4$ and $y = 2^{x+6} - 5$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$23 = \left(\frac{3}{5}\right) \cdot 10^{-4t/7}$$

Divide both sides by $\frac{3}{5}$.

$$\frac{23 \cdot 5}{3} = 10^{-4t/7}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{23 \cdot 5}{3}\right) = \frac{-4t}{7}$$

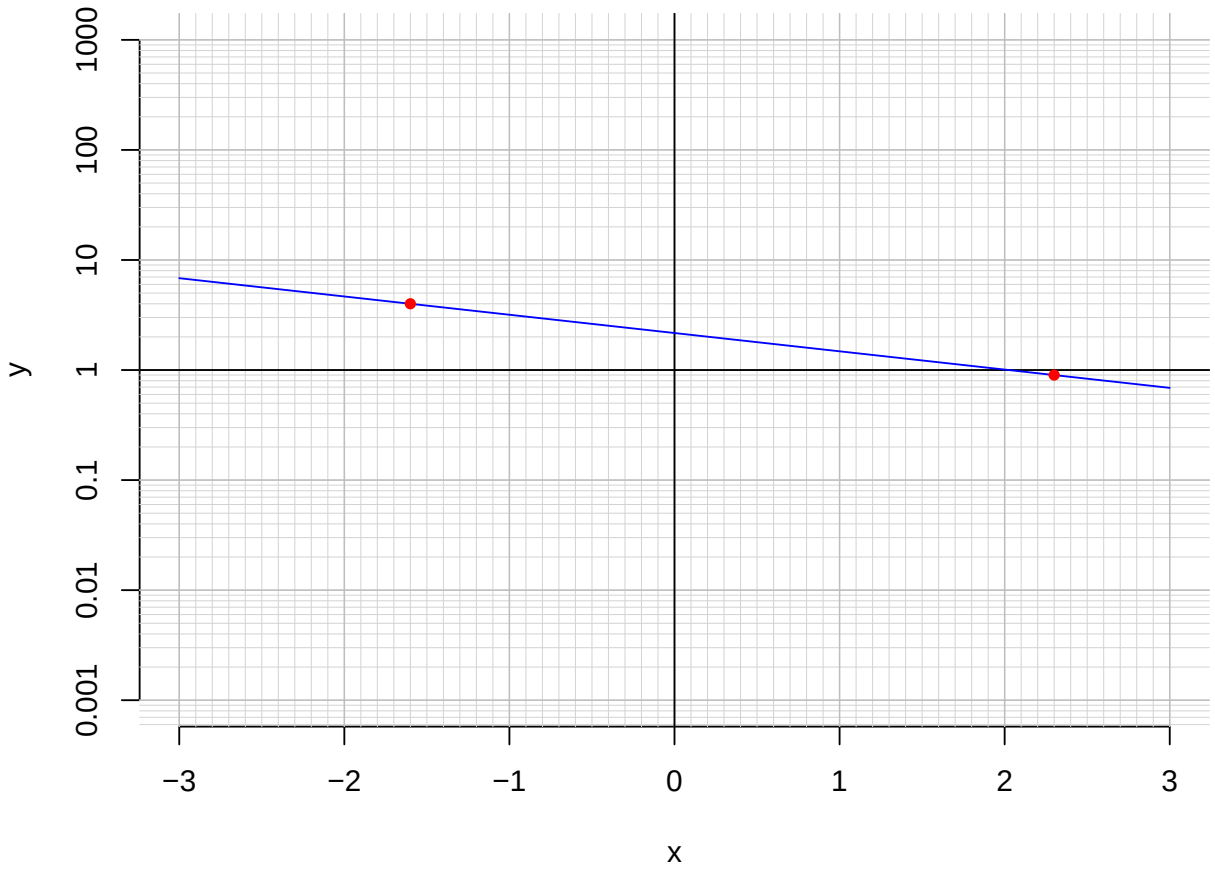
Divide both sides by $\frac{-4}{7}$.

$$\frac{-7}{4} \cdot \log_{10}\left(\frac{23 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{-7}{4} \cdot \log_{10}\left(\frac{23 \cdot 5}{3}\right)$$

3. An exponential function $f(x) = 2.17 \cdot e^{-0.382x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-1.6)$.

$$f(-1.6) = 4$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.382} \cdot \ln\left(\frac{x}{2.17}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.9)$.

$$f^{-1}(0.9) = 2.3$$